THE GEOMETRIC CUBIT AS A BASIS OF PROPORTION IN THE PLANS OF MEDIÆVAL BUILDINGS.

By F. Bligh Bond [*F.*].

IN response to an invitation to contribute a Paper on a subject of interest to the profession at large, the writer offers in the following essay a theory which he has for some time past been testing, and which tends in his opinion to explain a principle of proportion found in many mediæval works for which an adequate explanation seems to have been lacking. Much research and good scholarship will be needed in order to establish his theory and to win it general acceptance—should it be found to merit that reward—but the writer's apology for putting it forward at the present stage of his research is that it answers, or appears to answer, equally the historical as well as the practical and arithmetical tests, and to reconcile in a remarkable way certain doubts and contradictions.

In order to clear the position it will be necessary to state briefly a few well-known facts accessible to students in recent editions of *Gwilt's Encyclopædia* and in works therein referred to. It appears from contemporary records that there were in the Middle Ages two rival geometrical systems for setting out the ground plans of churches and other Gothic buildings, and these were also applied to their cross sections and sectional elevations. These were :—

(1) A system of commensurate squares.

(2) A system of equilateral triangles, which, when contained in parallelograms, gave a rectangular field or setting.

Our chief authority for these is Cesariano, the sixteenth-century translator (or editor) of the works of Vitruvius. Both systems were habitually applied, and there are records extant of controversies which took place between adherents of the rival schools. The first rule, that of the commensurate squares, is called by Cesariano the rule " a pariquadrato," and the second, the rule " a trigono." The first was adopted by the German architects and became more or less identified with their system. The second seems to have been favoured by the Latins, but it will be well not to be too insistent upon this point in the present stage of research.

The Aim of the Systems.

We now begin to break new ground. The question arises : Were the two methods of planning designed to produce results of a different nature, or were they meant to yield effects approximately similar ? The question is of crucial importance, and its answer implies also the solution of some obscure points of mediæval planning, and the discovery of the principle at stake in these bitter controversies.

What was this Principle ?

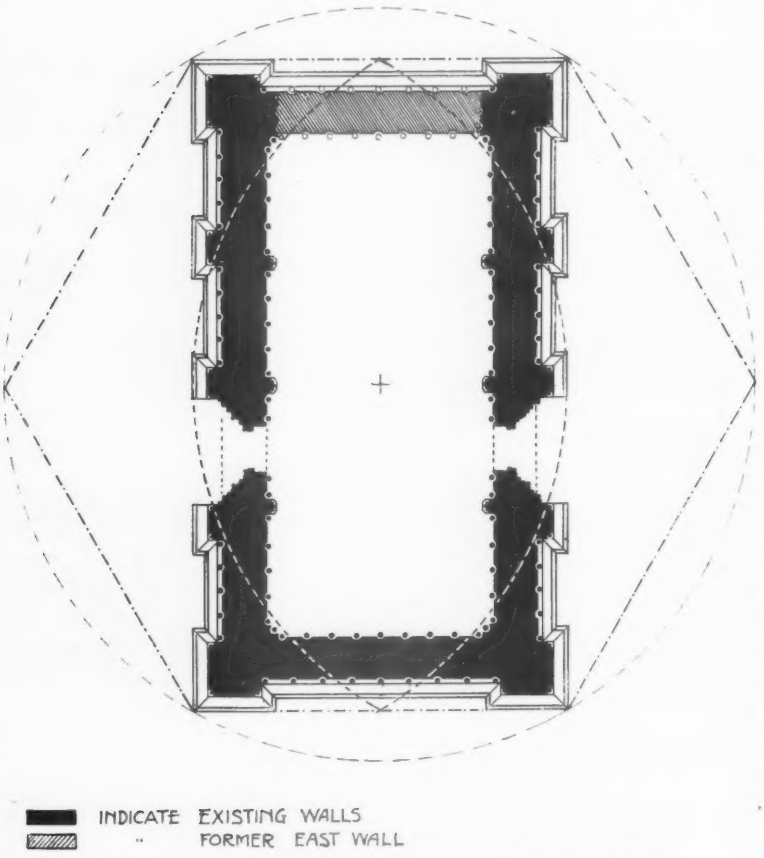
In the writer's view, it was one of geometrical perfection, the object being the reproduction of the form of the Rhombus of two equilateral triangles in the greatest degree of accuracy consonant with practical methods of building and harmonious scales of measurement. As to the motive which led the

ancients to their preference for geometric truth—that is another question. For the moment we are on safe ground in accepting it as an axiom of their system that they did work where possible on geometric lines, and that from very early times a peculiar respect—even a sanctity—attached to those proportionals which most clearly accorded with the mathematical principles known to Master Masons.

From this it will be inferred that the contest was one between principle and compromise, the rule "a trigono" being the use of the purist school, and that "a pariquadrato" of the practical builders. The "German" school, logical and practical, preferred to work on a system wherein the measures of length and breadth were commensurate or uniform, whilst their idealist opponents saw in this something approaching a profane disregard of principles instilled into their guilds by the teaching of a tradition so old, so venerable, that to depart from it was architectural heresy. But even they must have perceived and found by experience a limit of possibility in practical working, and hence in Cesariano we find in the instance he gives of the designing of the Cathedral of Milan a reconciliation of the two ideals.

The Rhombus or Vesica.

Readers are referred to Gwilt (Ch. IV. sec. 3) for an exposition of this highly symbolic feature, based upon the construction given by Euclid in his first proposition. Among all the select proportionals used by the old builders, this, the ratio of length to breadth in the double triangle, seems to stand apart in a position of pre-eminence. Not only do we find it reproduced in many approximations in the plans of our own and continental churches, but it is notoriously used in Gothic detail wherever the architectural expression of the best periods reaches its highest point. And its association with certain parts of a church and with statuary of a certain order leaves no doubt of its symbolic intent.



Glastonbury Abbey, Somerset: Chapel of St. Mary the Virgin. Plan showing Rhombic Proportions.

Modern writers have discovered and chronicled many examples of these proportionals in our mediæval plans. Notably Kerrich, in his communications to the Society of Antiquaries in the second decade of the last century, has furnished us with material for reference, and following him comes Professor Cockerell with his analysis of the works of William of Wykeham, in

which the rule " a pariquadrato " seems to find expression, seeing that the ratio he employs is the most practical of all, and the one which least truly approximates to the ideal proportions of the double triangle, though in buildings of lesser size it would be near enough to exemplify that principle. This is the ratio of Four in breadth to Seven in length. This we will call the " Masons' Convention."

The English Perpendicular, in which William of Wykeham worked, was in some respects a reversion to practical principles, though it must not be assumed that the scheme of symbolic representation by number and proportion, into which Durandus gives us a guarded insight, was superseded by the later builders altogether. It probably tended with time to become over-elaborate, and for that very reason a reaction would sooner or later be inevitable, by which processes of simplification would assert themselves.

To find the geometrical principle in its more perfect expression an examination must be made of the works of the best period, that is to say, the time when architectural achievement had reached its highest point and decadence had not set in. This would be the twelfth century and the early thirteenth century of English work. And reference should be made to examples of the most careful character and least altered by subsequent builders.

It has been the writer's good fortune to discover an almost perfect example of such a principle in the Lady Chapel of Glastonbury Abbey, a structure whose history would be all in favour of a perfect symbolic expression, since the extreme and scrupulous care used by its builders in designing it on ancient lines is on record. Kerrich alludes to this building and gives diagrams and dimensions, but he was not accurately informed as to its true proportions, which have only been recoverable by careful measurement owing to the violence to which the building has been subjected and its consequent partial collapse in width at one end. A plan of this chapel is given, from which it will be seen that the figure of the Vesica is present in a form so nearly accurate as to leave only the most insignificant margin of error, and the figure is repeated in duplicate on the main axis.

The Geometric Ratio.

The true proportion of the double triangle is as 1 in breadth to the square root of 3 in length, or as 1 : 1·73205. A building 40 feet in breadth would thus have a proportionate length of 69·282 feet or, say, 69 feet 4 inches.

St. Mary's Chapel has a width, measured on the west face, of 40 feet 1 inch, but as some of the joints have opened it may be taken to have been intended originally for 40 feet. This is the measurement outside the plinth of the angle turrets. In the length there is another open joint to be allowed for, and for this we must deduct nearly an inch. The present measurement is 69 feet 7 inches, and with the corresponding deduction comes to 69 feet 6 inches. If the conventional 4 to 7 had been employed, it must have been about 6 inches longer.

But the inner measurement, which is the breadth between the buttress faces on centre of north and south walls, is computed to have been as nearly as possible 37 feet, and hardly even now deviates from that figure. The proportionate length brings us in this case to the face of the west wall at the level of the cill beneath the recessed wall-arcade, and this is the most natural point from which to calculate a dimension of length.

Although the corresponding line on the east wall is now missing, owing to the removal of the central section for the inclusion of the Galilee—which was done in the fourteenth century—the evidence of the original length of the chapel is attested clearly enough by the remaining data.

The superior accuracy of the inner Rhombus, which is, after all, the measurement of the actual framework of the walling, gives us a suggestion of another and closer approximation to truth than the " Masons' Convention " first described. This nearer approach is represented by the ratio 37 : 64.

Allusion may here be made to a remarkable fact noted constantly by the writer in his measurements of the various parts of the fabric of Glastonbury Abbey and that of the other foundations and walls

discovered. It is that the whole scheme of the Abbatial church and buildings appears to be planned upon a series of commensurate squares of 37 feet, or more accurately speaking, of twice 37, that is, 74 feet. The west wall of St. Mary's Chapel marks the western limit of this great series of squares, which are figured in a plan contributed to the *Somerset Archæological Society's Proceedings* for 1913. The reason for the choice of this number of feet (or inches) as the unit of general measurement is still under investigation and will take some time to determine, as it is by no means clear that some second standard of measure, different to the English foot or yard, was not employed, such as the ell of 37 inches, which was used at Gloucester as a land measure, and may have been used also by the Glastonbury builders.

But this is a digression from the main issue. We have now two approximations to a geometric rule: one rough, but extremely simple and convenient (4 : 7), capable of lending itself to the making of handy builders' measuring rods, and the second a finer adjustment but inferior in convenience, since 37 inches is a long scale, and a relatively clumsy one to deal with,* the compensating feature in this case being that the longer proportional 64 is capable of sub-division by repeated bisection to an extent which would surely have commended itself to the practical mason.

Other Approximations.

We may now enquire what other fractions will yield us good conventional working elements for the setting out of buildings to the rhombic proportion? In what other manner could the architects of the former time have divided their measuring rods so as to secure the desired result without undue difficulty or inconvenience? There are several fractions giving a near approximation to truth, but only one or two which could be called convenient. The best of these is the ratio 26 to 15, which is alluded to in a work which will be found in the R.I.B.A. Library, entitled *The Canon—An Exposition of the Pagan Mystery perpetuated in the Cabala as the Rule of all the Arts* (London: Elkin Mathews, 1897). This work, being very mystical and ill-arranged, is not freely consulted, but it is evident that the author was well read in his subject and has been most painstaking in his collection of evidence on such points as connect the ancient rules of building with geometrical symbolism. We gather from his pages that he considers that the ratio 26 : 15 was well known and of high repute among the ancients in some such connection as the tradition inherited by the mediæval builders from remoter antiquity would point out. The Louvre Cubit of 28 digits, unequally divided as 13 : 15, might suggest a practical application of this principle.

We have yet, however, to find proof of the use of these proportionals either in the known history of our building measures or as evidenced in the masonry of our own schools of builders. But this may well be due, as regards the last-mentioned, to a want of definiteness in research. It is a point which would clearly have easily eluded any investigation not based upon the *a priori* conception of the existence and use of such a proportional. In this respect it is hoped that the present essay may stimulate research.

But another and very fair adjustment of scales to integral number in inches offering a near approach to the rhombic ratio is that of 11 to 19—with its complementary ratio 19 to 33. Take 33 inches as your "yard," and the cross measure 19 inches, which we may describe as a "cubit," and you have a very workable pair of measures, since 19 inches is 18 + 1, and 11 inches is 12 — 1. We do not say that there is any warrant for the assumption that such a pair of measures was actually in use, but in all these cases it is well to remember that the masons were undoubtedly in the constant habit of halving, doubling, or otherwise devising simple and compound fractions of their normal standards, and indeed, our own foot of 12 inches is a case in point, seeing that it is one-third of the real standard, that is to say, of the yard. And in this connection it is sufficiently clear that a cubit was often employed which was 1½ feet in length, or half a yard, whilst there is also evidence of an 11-inch foot.†

* In the Gloucester records it is viewed as a yard-and-an-inch, or thumb, and spoken of as "virga cum pollice interposito."

† The ratio $2\times19 : 3\times11$ (38 : 33) also subsists in our land measures as it is the ratio of the nautical mile to the statute mile (2026·67 yards : 1,760 yards).

The Geometric Cubit.

The title chosen for this Paper must now be justified. We are dealing with a proportional which, as already shown, bears to the 12-inch foot the approximate relation of $\sqrt{3} : 1$. Theoretically it is the Mean Proportional between the foot and the yard, but in practice it could not be so if any arithmetical convention were used for harmonising it with the other standards, since any artificial adjustment, if it increased the difference between the foot and the geometric mean, must correspondingly decrease that which lies between this mean measure and the yard, and *vice versa*. In this case the proportionals would appear as :

Foot	Cubit	Yard
4	: 7 :	12

Hence greater accuracy would be desirable. There is a triplet of measures to be kept in reasonable harmony. Our yard and foot are ancient measures—so ancient, indeed, that the mere statement of their probable antiquity is apt to excite scepticism. But the fact remains that they are in close geometrical relation with the principal measure employed by the builders of antiquity—*i.e.*, the cubit of 7 palms ; and if this geometrical relation be admitted, then they may be claimed to have been in all probability the original standard from which that cubit was derived, seeing that they do, as a matter of fact, happen to be in the strictest sense of the word geometrical measures—that is to say, measures of the earth's axis. For it has been stated on good authority that our inch, the unit on which the foot and yard are based, represents within a close approximation a fraction of $\frac{1}{500,000,000}$ part of the earth's axial length. Sir J. Herschel, in a letter to the *Times* dated 30th April 1869, says that the inch appears to have deviated from geometric accuracy by the loss of just $\frac{1}{999}$ of its length. Sir C. Warren, however, in his work on the *Ancient Cubit* seems to regard even this as an over-estimate. In any case the loss is so minute as to be negligible in practice, and the amazing fact is that the standard, if originally derived from the earth's measure, should have been so well maintained. The cubit, which is the mean between our foot and yard, is strictly 20·7846 inches, and is the side of a square whose area is 432 square inches, equivalent to an area of 24 inches × 18 inches.

The prime object of the use of the Mean Proportional in measures would appear to be to provide a Standard of Area, of square form, from which other spaces of equivalent area might readily be derived. There is evidence of the highest antiquity for the practice of obtaining equal areas with diverse proportionals. It is found in the ancient Indian " Shilpashastras," or rules of religious art ; and Professor Petrie notes such a custom as controlling methods of the Egyptian builders.* In the King's Chamber of the Great Pyramid are recorded, in linear measure, the roots of the simpler arithmetical values, such as are employed for this purpose. These roots would appear to have been among the more guarded traditions of the ancient builders. In the case of the mediæval workers, however, there does not at present appear sufficient evidence that their object was the equalising of areas of floor or wall space, but it is more likely that the practice of employing these proportionals had become so interwoven with their traditions, and so hallowed by time and religious association, that it had taken on a purely symbolic implication. This would be pre-eminently so in regard to the use of the triangular proportions, as the history of the Vesica shows plainly enough.

But, more than this, it must always be borne in mind that a practice of this sort may be grafted on original necessities of the craft, and that the mason, in order to set out his square and perpendicular lines, must necessarily have made use of the equilateral triangle on each side of his base line of standard length, and would thus obtain a third measure which would be the geometric mean between his two principal units of linear measure.

The triangular ratio does not appear definitely in Egyptian monuments, which rather follow the laws of the numbers 2 and 5 and their roots—the proportions of the side of the square to its diagonal and of the right-angled triangle whose sides are as 2 : 1, and the hypothenuse consequently $\sqrt{5}$, since

* *Pyramids and Temples of Gizeh*, pp. 194, 199, 200, 220, and p. 181 ref.

$2^2+1=5$, the square on the same. Nevertheless, in Egypt appears in later times a well-marked triplicity of measure, similar to our own, the extreme proportionals being in their case the Mahi, or Nile cubit of 20·76 inches (or thereabouts) and its triple, the Xylon, or staff-measure; whilst their unrecorded mean would be as nearly as possible our yard of 36 inches. The tripling of measures had, without doubt, a religious—probably a Trinitarian—significance, and in the choice of the two leading units we may recall the proportions of the first Hebrew Temple, with its single and double square areas, the Holy of Holies and the Holy Place—together, three squares in length. It would be well if, in the case of some of our own unspoilt Early churches, a careful measurement of the floor areas of the nave and quire (often square) could be made, with the object of testing the principle involved, by finding the side of a true square of the same total area.

To revert to our own units of length. A witty Frenchman once said, "If God did not exist, we should have to invent Him," and the writer would be disposed to make a similar observation with regard to our Inch, that, if it did not exist, we should have to discover it—in order to explain the measures of the ancient world, to reconcile their apparent incompatibilities, and introduce any coherence amongst them. For truly our measures would appear the only possible nucleus of a stable system to which these others could be linked, unless we are to be content with a merely physical—*i.e.* corporal—origin for all. Such human measures are well known and admitted, but their use argues a perpetual variability, and does not logically exclude the geometrical theory, any more than the counting of fives and tens on the fingers excludes a quite distinct geometrical basis for the denary system of notation. (This geometrical foundation can be shown and is of the greatest interest.) Some measures are strictly geometric (in the sense of terrestrial measure). Others are in mathematical relation with these (as the cubit of seven palms). Many are ascertained to have a counterpart in the measures of the human frame. The two systems co-exist, blend, and harmonise. But we must make our choice as to those which we deem original, and those which we think derived. In the writer's view the most reasonable working hypothesis is that the Inch, Foot, and Yard are the original series, and the Cubit, a measure of acknowledged variability, the secondary or derived one.

The argument from antiquity is fortified by the facts in the following table, which shows the units required for setting out areas equivalent to that of a given square, with sides proportioned as 2 : 1, 3 : 1, and 5 : 4.

(1) Assumed Original Unit, on the primitive sexagesimal system:
$36'' \times 36'' = 1296$ square inches — Sides. $36''$ = 1 yard.

(2) First derivative (for a double square):
$(36 \times \sqrt{2}) : (36 \times \frac{1}{\sqrt{2}}) - unit$, $36 \times \frac{1}{\sqrt{2}} = 25''{\cdot}45$ (Cf. Royal Cubit of Persia, Chaldea, and Judah.)

(3) Second derivative (for a triple square):
$(36 \times \sqrt{3}) : (36 \times \frac{1}{\sqrt{3}}) - unit$, $36 \times \frac{1}{\sqrt{3}} = 20''{\cdot}78$ = Egyptian Royal Cubit.

(4) Third derivative (for a rectangle proportioned as 5 : 4):
$(36 \times \frac{\sqrt{5}}{2}) : (36 \times \frac{2}{\sqrt{5}}) - unit$, $36 \times \frac{\sqrt{5}}{2} = 40''{\cdot}248$ = Egyptian Metric Yard (early form).

These results err but very slightly on the side of excess, the average in each case being a trifle lower in the case of known examples, but, being geometrical, are liable to modification to suit any arithmetical adjustment of scales desired.

How small, comparatively, are the differences between them and actually discovered units will be seen by the following table :—

(1) Yard.	(2) Chaldean Cubit.	(3) Egyptian Cubit.	(4) Old Metre.
36″ Eng.	25·45 Geometric.	20·78 Geometric.	40″·248 Geometric.
36″ Gt. Pyramid (Great Step)	25·38 Maximum found	20·76 Nilometer	40″·23 Egyptian
(Practically alike)	00·07 defect.	00·02 defect.	00·018 defect.
			or 00·009 on the half metre.

The Egyptian Royal Cubit was of seven palms, each measuring from about 2″·91 to 2″·95 according to the size of the digit (·727 to ·737). The " Pyramid " palm yields a digit approaching the latter.

40 digits of ·735—or 12 palms=29″·4, again a derivative of the yard, since $36 \times \frac{\sqrt{6}}{3} = 29''{\cdot}40$.

The division of the Royal Cubit into seven palms seems good evidence of the presence of the seven as a proportional, either as 5 : 7 : 10, or (more probably) as 4 : 7 : 12. The cubits vary from about 20″·5 to 21″. Seven-fourths of 12″ is 21″, and twelve-sevenths of 12″ is 20″·57, which is nearly the Louvre Cubit.

The Cubit of 20·63, found by Professor Petrie in the King's Chamber, seems to be the most representative cubit of this order. These 28-digit cubits are Royal, or Temple, Cubits. The Common cubit is of six palms.* The European cubit seems to accord very nearly with the latter, and become readily identified with the half-yard of 18″. The Seven stands out prominently as a proportional both in ancient and mediæval usage. With the Egyptians it appears to have ruled the relation of square and diagonal, since the side of a square is very nearly as 5 : 7, or as 7 : 10 of its diagonal.

We can express this ratio as 5 : 7 : 10
or as 7 : 10 : 14
12 : 17 : 24

and the sum of the two sets of proportionals gives us the better adjustment (12 : 17) found in Roman work.

To summarise our conclusions—in the old and mediæval systems of measure we can discern at least three main standards :

(1) The Yard, with a *senary* division representing the old sexagesimal system.

(2) The Metre, representing the $\sqrt{5}$ and $\sqrt{2}$ derivatives, with a *decimal* division.

(3) The Cubit, representing the $\sqrt{3}$ derivatives, with the proportionals 4 : 7 : 12, and a consequent division into 28 (4×7), or into 84 (·7×12).

Of these the first is the overt measure in English work, the 21″ cubit being a latent proportional. In Egypt the cubit is the overt measure, and the yard is implicit only, or scarcely to be detected in the monuments. The second, the old metre, is common to both systems, and though abolished by statute in this country since 1439, is still well represented by our *decimal* system of land measure, where the unit is 3″·96 (+·06), giving us the Fathom of 79″·2—$\frac{2}{10}$ of a yard. Were our Metric Yard still in use, it may be that our debt to Egypt in the matter of measures would more readily have been recognised.

* Usually about 18″·24. It unites in square measure with the cubit of 20·63, forming a rectangle of 376 square inches, equivalent in area to one square Euboic cubit, and almost precisely 7/12ths of the area of one square Royal Cubit of 25.38 (=644 sq. ins.). With the square " Remen," which is 4/12ths of the same area, we have again the triplicity 4 : 7 : 12, this time in surface measure.

CHARING CROSS BRIDGE BILL.

The South Eastern Railway Company's proposal to construct a series of steel cantilevers of arched form under the down stream portion of the existing bridge may or may not be necessary to secure the maximum use of the bridge. It is evident, however, that any such work will in all probability defer indefinitely the proposal for the much needed road bridge across the river at this point, a proposal which has been continuously urged by leading Londoners for some years. It is evident also that any such work cannot be carried out, or even commenced, during the war, so that it was an eminently reasonable proposal that was put forward by the Institute and the London Society that the proposed works should be postponed until, say, two years after the war, to allow time for the full and proper consideration of the whole subject, especially as to the needs of the road traffic from the West End to and from Waterloo Station, and the possibilities for the construction of a fine new bridge.

That the views of the Institute and the London Society met with wide and influential support is evident from the fact that the House of Lords itself passed an instruction to the Committee considering the Railway Company's Bill,* " to take into consideration the requirements of the traffic over the river at Charing Cross and the effect which the Bill will have upon them, and to hear evidence from the Royal Institute of British Architects, the London Society, and others on the treatment generally of this very important part of London." Such an instruction to a Parliamentary Committee is almost unprecedented, and in itself is a testimony both to the importance of the subject and to the recognised standing of the Institute.

The Bill came before the House of Lords Committee on the 19th May, and during the four days of its consideration by the Committee it was evident that there was general agreement, even on the part of the Railway Company itself, that the present unsightly bridge is an eyesore which all would be glad to see removed, and that a fine new road bridge would be a very desirable thing.

The Marquis of Bristol, as chairman of the Parliamentary Committee, said " we should all like to see it," and there is no doubt as to the sincerity of the statement.

Mr. Clode, K.C., and Mr. Scholefield were counsel for the Railway Company, and Mr. Honoratus Lloyd was retained for the Port of London Authority.

The case for the promoters was that the strengthening proposed was to enable full use to be made of the bridge. Owing to the increasing weight of the modern locomotive, the railway company had been obliged to put a restriction on the use of the older portion of the bridge, so that of four tracks available not more than two tracks, and these not adjacent, could be used at one time, for any except stationary trains. It was contended by the Company that the proposed expenditure of some £167,000 was in the nature of a " temporary " strengthening, and the implication was that any such expenditure would not interfere substantially with the larger scheme that might be necessary later on.

There was considerable opposition to the proposed arched cantilevers from the Wandsworth Gas Company, which owns several large steam colliers, and the contention was advanced that navigation would be rendered difficult, owing to the curve of the river at Charing Cross; but this point did not appear to carry weight with the Committee.

The opposition on behalf of the Royal Institute and the London Society was represented by Mr. Vesey Knox, K.C., who had with him Mr. R. Glen. Mr. Freeman, K.C., appeared for the London County Council. Most valuable evidence was given by Mr. John Burns, M.P., and Sir William Lever, on behalf of the Institute's suggestion for a comprehensive scheme, and the point was strongly brought out that, apart from Parliament itself, there is no body or authority with the requisite powers to consider and weigh up the merits or demerits of such proposals as this, and if necessary veto them in the public interest.

The London County Council and the Port of London Authority have given considerable attention to the question of Thames bridges, but neither authority has plenary powers even in this respect: hence it is all-important that such bodies as the Royal Institute and the London Society should keep a watchful eye on proposals of this kind until such time as a powerful public authority can be given control of the future of London.

Sir Aston Webb, R.A., gave evidence as Chairman of the London Society, the R.I.B.A. Town Planning Committee, and the Joint Committee of the two societies specially appointed to deal with Charing Cross Bridge. He said that the Institute was not committed to any particular scheme, whether for a high level bridge or a low level bridge, at Charing Cross, but strongly urged the necessity for full consideration being given to the whole matter, in the interests of London, before allowing the Railway Company to spend a large sum of money to perpetuate or give a further lease of life to the present unsatisfactory structure. He thought that after the war there would be here a grand opportunity for some Imperial memorial of the war. After the great war of 100 years ago, we had Waterloo Bridge—in itself a grand memorial of a grand struggle. The great period of reconstruction after the Napoleonic Wars gave us, in addition, Regent Street, built in 1819, and many similar architectural works, and there was every probability that the close of the present war would provide the same opportunities.

The Committee called as their own witness Sir Lionel Earle, Permanent Secretary of H.M. Office of Works, who expressed the opinion that, from the architectural point of view, the Railway Company's pro-

* See R.I.B.A. JOURNAL, pp. 173 and 189.

posal was a very objectionable one, and that a new Station on the south side was desirable.

Mr. Andrew Taylor [*F.*], Chairman of the Improvements Committee of the London County Council, in giving evidence on behalf of the London County Council in support of the request for postponement of the Railway Company's proposal, said he thought that if the matter could be postponed as suggested, the London County Council would certainly take into consideration the question of the construction of a road bridge at Charing Cross, and he had every confidence that the various authorities concerned could be brought into agreement on the matter.

Professor Beresford Pite [*F.*] and Mr. Paul Waterhouse [*F.*] were also to have given evidence, and it is regrettable that the Parliamentary Committee did not see their way to hear their evidence, which could have brought out some valuable additional points on the traffic side of the question.

Mr. Leonard Stokes [*F.*] and Mr. Howley Sim [*A.*] were also present as members of the Westminster City Council, in support of the Institute's point of view.

The present position is that, although the House of Lords Committee have found the preamble of the Bill proved, a clause has been inserted that the works are not to be commenced without the consent of H.M. Treasury, until a period of one year after the war, so that, although the time for consideration is limited, there is still room for the formulation of a comprehensive proposal for this part of the river, and we note with satisfaction, from Mr. Andrew Taylor's statement on behalf of the London County Council, that the matter will not be neglected.

The thanks of the Institute and of the London Society are due to the Joint Committee of the two bodies presided over by Sir Aston Webb, R.A., which has not only given an immense amount of time and trouble to the consideration of the question and formulating the evidence, but has itself undertaken the financial responsibility of securing that the two Societies should be represented by counsel before the House of Lords Committee.

W. R. Davidge [*A.*],
Hon. Secretary, Joint Committee opposing Charing Cross Bridge Bill.

GEORGE THOMAS HINE [*F.*].

A MEDICAL APPRECIATION.

To the widespread regret which in many circles the death of Mr. G. T. Hine has caused, it is a privilege to be allowed to add, even though imperfectly, some expression of the high estimation in which he was held by the medical profession, and in particular by that branch of it which is concerned with the study and treatment of mental diseases.

The first link in the long chain of successes which ultimately so closely connected Mr. Hine with psychiatry was forged when in 1875 he—to use his own words—"made his *début* as an asylum architect" by designing the new asylum then about to be erected for his native town, Nottingham; and it is worthy of note that even in this, his first step in asylum planning, his dislike of any tendency to stereotypy in design may be observed; for in that asylum, now 36 years old, is to be found one of the earliest examples of wards specially planned for the safe accommodation of epileptics, whose segregation is a distinct advantage as well to other patients in an asylum as to themselves.

It would be outside the scope of these remarks to detail even the more prominent features of all the many new and important public asylums which he designed and completed; but, in making reference to some of them, what is desired especially to emphasise is the close watch he kept on the progress of medical thought as it affected that branch of medicine with which he was so intimately identified: nor was he content merely to maintain this watch, for, as manifested by his published writings, he was a wide reader of the history of the treatment of the insane, and thereby laid the best of all foundations on which to work when giving expression to medical aspirations in the exercise of his professional art.

Of all residential institutions, the modern asylum or hospital for the insane probably requires the maximum amount of detail, in the provision both of adequate opportunity to classify the patients and of special arrangements for their safety. During the period when it was thought desirable that all these facilities should be provided under one roof, Mr. Hine's acknowledged and consummate skill, especially in meeting all these requirements in a convenient compass, is perhaps best seen in the Claybury Asylum for the County of London, which was completed in 1893, and was the first asylum in this country planned *ab initio* for over 2,000 patients. Nor was this skill visible only in original designs, for his advice was in frequent request in remodelling portions of old asylums, either for purposes of enlargement or to meet modern requirements—a task perhaps sometimes demanding even greater resourcefulness than the conception of an original design.

Coincidently with the completion of the asylum just named, the merits of the "villa system" of asylums construction, as illustrated in America and on the Continent, were being advocated in this country. They were tentatively exemplified at Bexley Asylum, opened in 1898 for 2,000 patients, in the original design of which Mr. Hine included three detached and unfenced villas—two for chronic working patients capable of being given a considerable amount of parole, and one as a hospital either for tubercular cases or others requiring isolated treatment. The history of the third of these villas is interesting; for it was opened, and still continues, as the "admission hospital" for the female side of the asylum, and is the first example in the public asylums of this country of the use of an entirely detached and unfenced structure small enough to pro-

vide only for the reception and early treatment of newly admitted cases. Bexley is also interesting as being one of the first asylums, if not the first, in which, as regards the main building, supervision and administration are much facilitated by the fact that all the wards, besides each having its own access from the main corridor, communicate with one another, so that an officer may pay a complete round of either the male or female side without retracing his steps or being obliged to return to the corridor. Meanwhile Mr. Hine was engaged in planning the new East Sussex Asylum, opened in 1903 for 1,100 patients, the main building of which is remarkable for the admirable subdivision of the wards for acute cases and for the ingenious arrangement giving alternative access from the male or female side to two of the male infirmary wards, thus rendering the employment, if desired, of the female staff in the latter administratively very easy. Allusion is, however, made to this asylum mainly with a view to pointing out that, in its scheme, the partial adoption of the villa system received a notable extension, and included a detached building specially designed to serve as an "admission hospital" for the reception and early treatment of all new cases in complete dissociation from cases of chronic insanity. The design of the Long-Grove Asylum, opened in 1907 for the County of London, contained separate admission hospitals—one for each sex, and, besides several other villas, two small detached buildings to serve as "half-way homes" for convalescent cases; thus recognising the important desideratum that, in a modern asylum, a person suffering from a curable mental illness may find treatment in the best of surroundings and on modern lines without ever once having been in contact with the more unpleasant types of chronic insanity. This asylum is of interest also as regards its main building, in which covered ways and corridors entirely open on one side take the place of the usual type of closed corridor. In the new asylums for Hampshire and Swansea—commenced, but which Mr. Hine has not lived to see finished—several new and important features have been introduced; but enough has been said here to illustrate the true spirit of progress which characterised all his undertakings.

In 1897 the Commissioners in Lunacy—now the Board of Control—appointed Mr. Hine as their Consulting Architect, in which capacity his services were greatly valued and appreciated.

Further recognition was given to Mr. Hine's work, and more particularly to his keen insight and interest in its medical aspect, by his election in 1898 as an Honorary Member of the Medico-Psychological Association of Great Britain and Ireland—a distinction but sparingly bestowed even upon medical men, and which had only thrice previously been conferred on anyone outside the medical profession.

Though possessed of firm convictions and a strong will, courtesy and an endearing modesty as to his own attainments were never absent from his manner towards those with whom his work brought him in contact. To medical men engaged in asylum practice he willingly paid the compliment of advising every aspirant in asylum planning "to humble himself and sit at the feet of his Gamaliel, the asylum doctor." To the opinions of the latter he was ever ready to listen, and when convinced of the value of a suggestion no amount of extra time or trouble to incorporate it in a design did he grudge. "So double was his paines so double be his praise."

C. HUBERT BOND.
Commissioner of the Board of Control.

George Thomas Hine, late Consulting Architect to H.M. Commissioners in Lunacy, who died on the 25th April in his seventy-fifth year, had been a Fellow of the Institute since 1877, and as President of the Nottingham Architectural Association he served on the R.I.B.A. Council in 1888–89.

Born in Nottingham in 1841, he was the eldest son of the late Thomas Chambers Hine, F.S.A., an architect in a large way of practice in Nottingham and agent for the Nottingham Park Estate to three succeeding Dukes of Newcastle. He was first educated at a private school, and completed his education in Paris. In 1858 he was articled to his father, and remained with him until 1864, when, owing to a serious impediment in his speech, he left England and spent three years sheep-farming in Australia. At the request of his father he returned to England in 1867, and having partly overcome his infirmity of speech, he accepted the partnership offered him by his father and devoted himself assiduously to his profession.

In the early years of the partnership he assisted his father in laying out and developing the Nottingham estates of the Duke of Newcastle, particularly that of the Park, where they designed and superintended the erection of nearly a hundred houses, ranging in cost from £1,000 to £10,000. He was associated with his father in restoring the old Nottingham Castle and adapting it to the purposes of a Museum of Art in connection with the South Kensington Museum; also in the erection of the Nottingham County Assize Courts, and numerous churches, private residences, and warehouses in and about Nottingham, including the beautiful little chapel at Clumber House which the present Duke of Newcastle on his accession to the property pulled down to make room for a new church on a larger and more magnificent scale.

There was one work, however, during this period for which the junior partner was alone responsible, and the successful accomplishment of which brought him prominently to the front in connection with the special branch of architecture with which his name is identified. His father rarely took part in public competitions, but he encouraged his son to try his hand in the competition for a new Lunatic Asylum for the Borough of Nottingham. There were numerous competitors, and Mr. Hine's design was adjudged the best and was approved by the Lunacy Commissioners. The buildings, costing £35,000, were carried out to completion under his superintendence. The asylum was notable as containing one of the earliest special wards for epileptics.

The Nottingham Asylum was the forerunner of many such commissions. In 1886 Mr. Hine was invited by the Middlesex Justices to take part in a competition limited to six architects for the new Asylum at Claybury. Again the award was in his favour, and the building, remarkable on account of its size and type of plan, was commenced in 1887

and completed in 1893. In designing this building the problem which confronted the architect was to accommodate the two thousand patients within reasonable distance of the administrative centre without prejudice to the position and aspect of the wards. The plan he adopted was a modification of the echelon type, the wards being approached from obtusely oblique corridors, the pavilion system being almost a necessity from the conditions issued. The asylum is built on the top of a hill, falling all ways, and by removing the apex of the mound, representing nearly one hundred thousand yards of soil, a level plateau was obtained, sufficient to allow of about half the patients' blocks and the whole of the administrative department being erected at one uniform level, the remaining wards being slightly lower, though in no case more than five feet below the central buildings. The hundred thousand yards of soil were well disposed of in filling up a valley to the north of the Asylum. As Consulting Architect to the Lunacy Commissioners Mr. Hine always strongly urged architects designing asylums to give a first consideration to the site. In many of the plans which came under his official notice he complained that the buildings were generally left to adapt themselves to the site rather than the site being first adapted to the buildings. What, he asked, was the small additional capital charge compared with the perpetual inconvenience and extra cost of working a building, filled with feeble, irresponsible patients, which has numerous steps on the ground floor, up and down which food trolleys as well as patients have to be conveyed.

While the Claybury work was in progress Mr. Hine removed to London and established himself as a specialist in Asylum architecture. He was extraordinarily successful in competitions. During the short space of seven years he took part in no fewer than twelve competitions for asylums and other important buildings, and was awarded first place in seven, and second in the remaining five.

On the retirement of Mr. Howell, Mr. Hine was appointed Consulting Architect to H.M. Commissioners in Lunacy for England, a post which he held for some twenty years, during which time he voluntarily relinquished competition work. He was also Consulting Architect to the Edinburgh District Asylums Board, and for the large Asylum at Purdysburn for the Belfast district. Besides the Claybury Asylum he designed and completed for the London County Council the Asylums at Long Grove, Horton, and Bexley, at a cost of about a third of a million each. Other buildings of the same class designed and carried out by him include the County and Borough Asylums of East Sussex, Worcestershire, Sunderland, Hertfordshire, Kesteven, Surrey, Gateshead, Hampshire, Swansea and Merthyr. He was architect of substantial additions to the Asylums at Dorchester, Leicester, Nottingham, Moulsford, Wells, Cotford, St. Albans, Devizes, &c. His work everywhere received grateful recognition, and he was held in high honour by the doctors who practised in these institutions. He raised enormously the standard of asylum construction in this country, and from the humanitarian aspect undoubtedly proved himself to be a benefactor to the unfortunate victims of insanity for whose health and comfort he was always scheming. In 1901 he gave the profession the benefit of his ripe experience in a Paper on Asylums and Asylum Planning read before the Institute, and published, with a number of folding plans, in the JOURNAL for the 23rd February 1901. This Paper is still recognised as the standard publication on the subject. He contributed also several Papers on Asylum Construction to the Congress of Hygiene. In 1909 he took into partnership Mr. H. Carter Pegg [*F.*], who had been associated with him for over thirty years.

Mr. Hine was a Fellow of the Surveyors' Institution, an Hon. Member of the Medico-Psychological Association, and Past Master of the Royal Sussex Lodge No. 402 of Freemasons. He was a member of the Union, St. Stephen's, and Ranelagh Clubs, and one of the original six members who formed the Robin Hood Rifles (Notts). In 1870 he married Florence Deane, youngest daughter of the late Mr. Edmund Cooper, of Failand House, Somersetshire, who survives him. He leaves a son—Dr. T. G. Macaulay Hine, Major, R.A.M.C., now engaged on bacteriological work for the Army—and a married daughter, Mrs. Sidney Coxon, better known to the novel-reading public under her maiden name of "Muriel Hine."

Mr. Hine found his principal recreations in riding and shooting, in his earlier days being a keen follower of the South Notts hounds, and even up to a few years of his death he would ride down to his office in the mornings after a canter in the park. A great reader and a lover of art he was above all things an indefatigable worker. He died "in harness," as he himself desired, keen-witted and capable to the last, beloved by all who had come in contact with his genial, vivid, and sympathetic personality.

TOWN PLANNING.

PRÉCIS OF MR. LANCHESTER'S MADRAS LECTURES.—III.

(*Continued from p.* 225.)

The subject of the fourth lecture was "Historical Study of Town-Planning," and was illustrated by numerous plans of Egyptian, Greek, and Roman cities.

In the existing world, said the lecturer, is to be seen almost every stage of civic development. The primitive village gives some idea of the pre-historic town. The earliest types of building are usually circular. These do not offer a marked suggestion as to the lines of the town. As long as there was access to each house, that sufficed. Rectangular building naturally soon led to rectangular plan, and we consequently find this developing at an early stage of the more civilised peoples. Then the community demanded some central focus, either religious, commercial, or administrative: the Temple, the Agora, the forum or market place; the Palace or City Hall—sometimes these combined, sometimes grouped, sometimes separate. In the older civilisations, the tendency of the house was to become subordinated to definitely communal buildings. As far as we know, the Roman sense of law and discipline led them to introduce into the city that symmetry of plan that the Egyptians had developed in their temples. Their cities were influenced by the scheme of their military camp. In the disorganisation that followed the downfall of Rome, a few cities retained, to some extent, their original plan, but others almost vanished, to arise again in the haphazard lines grouped irregularly around the traffic routes which took the easiest line, regardless of symmetry. Cities deliberately planned were an exception.

At first the cities were more of the village type, and subsequent congestion was due to defensive walls. The charm of the mediæval city was due to the keen interest people had taken in the beauty of the buildings and their adaptation to the peculiarly varied conditions of site. It was left to the

Renaissance to take up the axial traditions of Roman planning, and, with a sense of form less pure than the Greek but far more developed than that of Rome, attempts were made to remodel, extend, and build cities in which the formality of the buildings was duly supported by an appropriate formality of lay-out. With the Renaissance came the expression of personal imaginings, the artist designing the city as the sculptor or the painter looking on his stone or his canvas. The Fontana at Rome was made the prototype of the Haussmann plans for Paris, with their predominant factor the vista. These individualists were influenced by many suggestions, such as the summit temples of Greece, the symmetrical regularity of Rome, the radial avenues and circular intersections of the hunting forest, as will be seen from their plans, but rarely by economic or social considerations—or, rather, the only social influences to which they were subject were those of the ruling princes and nobles. None the less, some sound and rational work was done, and much of it is still appropriate to the needs of our own time. Its weak point was the accommodation for the working people—these had been huddled together in Roman and mediæval cities, and the Renaissance brought little advance to them. Improved streets and open spaces helped somewhat, and building became more substantial, but in other respects their housing conditions were much the same.

The fifth lecture turned on "Tradition and City Development." The lecturer pointed out that the value of a city's traditions is measurable by the value of the part it has taken in the history of human development. In appraising this value we must beware of taking too narrow a view, of forming our opinions too closely on the ideals of the moment. Such ideals are perpetually reconstituting themselves, forming new combinations, by the advance and retirement of their leading components, as in a complex dance movement. We have, and rightly, the feeling that we ourselves have something to say in the development of the city, that with the recognition of a higher sense of communal life must come a more consistent and more definite manner for its expression, but let us not, on the other hand, condemn without the most careful consideration the efforts that are perhaps a little too near our own time to have acquired the dignity of age.

One of our chief difficulties lies in the fact that transportation facilities have changed the natural building materials in many districts. We cannot afford to disregard the economic aspect of building; in most cases we are pledged to give the maximum convenience within our means, using brick where we should formerly have employed stone, and other substitutes of a like character. As each material demands appropriate treatment, this adds a further difficulty to the task of harmonising the old with the new, yet with study and care a great deal can be done in the way of harmonising the general forms and colour schemes, even where different materials have to be used. Any attempt widely departing from local traditions is unlikely to be satisfactory, but the art of civic development comprises many other things besides the buildings. There is the framing up, as it were, and here we have again the task of reconciling new requirements with old, in a more accentuated form, probably, than in the case of structures themselves. As the result of this modification in our demands, the extensions to our cities usually assume a more rural aspect than anyone would have regarded as possible some years ago.

The usual manner in which we comprehend the character of a large town is by a succession of impressions as we pass from one point to another. Normally we receive these impressions during our approach to or departure from some point near the centre; in the first case there would be a gradual transition from natural beauty to formal dignity, in the other the order would be reversed. We may reach a subsidiary centre with formal lay-out, and afterwards return to a looser and more open type of plan; but as we pass inward, each culminating point should transcend the preceding one, in respect of importance and dignity, while in the outward course the domination of natural beauty should become more marked at each intermediate point.

With the railways but little can be done, but there is much that we ought to take in hand in amending and beautifying our road approaches. Before the advent of the railways, a fine tradition had been established in respect to main roads, and it is for us to take up this tradition where it was dropped, and develop it on the basis of our own requirements. In so doing, a number of difficulties face us, the most serious being the linking up of our new developments with the older ones of the ante-railway period. There is another aspect of the problem. An important route demands a certain firmness of definition and formality. If we seek for the traditional method, we find lines of building continuing in well-proportioned masses on either side of the wide road. We have abandoned the use of blocks on this scale and demand that dwellings shall be spread out over a much larger area of land; our buildings are, therefore, relatively ineffective and are not to be relied on as an enhancement to the dignity of the thoroughfare. What can be substituted? We must have trees; a fine avenue (double rows on each side if possible) is almost as impressive and dignified as the massive terraces of former years, and the farther we go from the city centre the more appropriate these avenues become. They should not be quite continuous, as this would be somewhat monotonous in effect. Where justifiable, a group of buildings of suitable mass and scale should strike the eye, and the proximity of water or hills should be taken advantage of to provide variety of outlook. Other types of traditions to be considered are those of business, of employment, of worship, education, and recreation, all demanding appropriate expression in buildings and their environment. There are features whose preservation it has not been customary to regard as of essential value, such as the old fort and city walls: these have too often been destroyed, without sufficient reason, sometimes to the serious detriment of the city's appearance.

A movement is now beginning that must in many ways affect the general appearance of the Indian city. The more open lay-out; the increased proportion of detached buildings; the new requirements for administrative, educational and other purposes, involve of necessity a variation in type. Let it be your care, therefore, that no unnecessary divergencies tend still further to break up the harmony of effect, but by maintaining the general characteristics of form and design to secure as far as possible a continuity of manner, so that the old shall blend insensibly into the new. Our city is bound to be composed of a number of different kinds of building, expressing their differences, but they may be held together by the thread of tradition in architectural expression, much in the same way as the actual masses of these groups may be somewhat discordant in the variety of their intention, but can be unified by lines and masses of trees linking them together and disguising or softening their discordancies.

9 CONDUIT STREET, LONDON W., 10*th June* 1916.

CHRONICLE.

Lord Kitchener [*H.F.*] **and Sir H. F. Donaldson** [*H.A.*].

By the tragic event which has so profoundly moved the nation this week the Institute has lost one of the most eminent of its Honorary Fellows, together with a distinguished Honorary Associate, both of whom in the past had rendered useful personal service to the Institute. Lord Kitchener was elected Honorary Fellow in 1910; Sir Hay Frederick Donaldson, who perished with him, had been an Honorary Associate since 1896.

At the Town Planning Conference held at the Institute in 1910, Lord Kitchener, who was known to hold very enlightened views on the subject, kindly took the Chair at one of the meetings when a Paper on the Planning of Khartoum and Omdurman was read, and himself contributed an interesting address on the occasion. Through his exertions, after bringing the Khalifa's reign of terror to an end, the miserable, filthy, mud-built old town of Khartoum was transformed into a handsome, dignified, and salubrious city, with a thriving and contented population. Omdurman also he converted from an unhealthy "rabbit-warren" into a decent, orderly town. Lord Kitchener, it is said, had a passion for architecture, and had indulged it to good effect, notably at Simla, at Cairo, and on his own property at Broome Park.

Sir Hay Frederick Donaldson came into touch with the Institute in 1895, at the time of the Brickwork Tests carried out by the Science Standing Committee. He was at that time Chief Engineer of the London and India Docks Joint Committee, and was instrumental in procuring for the Institute the use of a vacant piece of ground on which to conduct the experiments. He took an active part in the investigations, and brought out some useful points in the discussion on the Science Committee's Report.

Architects and Military Service.

The arrangements made by the Royal Institute of British Architects and the Queen's Westminster Rifles for the enlistment of members desiring to serve together have unfortunately had to be cancelled, as the War Office has found it necessary to stop further recruiting for this Regiment.

Fresh arrangements have now been made with other regiments in which members of the Royal Institute and other architects will be welcomed if they will come forward without loss of time. Anyone desirous of taking advantage of these arrangements should apply at once to Lieutenant and Quartermaster H. G. James, 22nd Battalion (R.) King's Royal Rifles, Norfolk House, Laurence Pountney Hill, E.C., or to Captain Briggs, 23rd County of London Battalion (T.), 27 St. John's Hill, Clapham Junction.

Unattested men can enlist at once in either of these battalions, provided they are fit for general service and are up to the prescribed standards. Attested men should apply either to Captain Briggs or to Lieutenant James for a letter which will enable them to complete their attestation at their local recruiting centre and to be transferred to the battalion which they wish to join.

It has also to be announced that the 20th London Regiment (T.) has vacancies for some 500 men. If sufficient architects joined this regiment an "Architects' Company" would be formed and they would be kept together during training. Intending recruits should apply to Major Dodd, Holly Hedge House, Blackheath (telephone, Lee Green 962).

Lieut.-Colonel S. W. Cranfield [*A.*], commanding the 3/7th D.C.O. (Middlesex Regiment), states that he is prepared to take 50 or 60 architect recruits in his battalion. They must be medically fit for service abroad. Intending recruits should write to Headquarters, 3/7th D.C.O. (Middlesex Regiment), Solefields Camp, Sevenoaks, and they will receive a free railway warrant. On reporting they will be enlisted, and given leave to settle up their private affairs.

The R.I.B.A. Record of Honour: Thirtieth List.

Killed in Action.

HILLYER, WILLIAM HAROLD [*Student*], Captain, R.E. Killed in action in France on 22nd May. Aged thirty-five.

Capt. Hillyer was the second son of the late W. J. Hillyer, of Blandford, Dorset, and of Mrs. Hillyer, of Lyncroft, Shortlands, Kent. Educated at Timsbury, Eastbourne, and Dover College, he served his articles with Mr. S. Clifford Lee, of Moorgate Street, and studied at the Royal Academy Schools. He was assistant for a time in the Architects' Department of the London County Council, and was afterwards in Mr. Leonard Stokes's office, and later with Sir Aston Webb. He subsequently started on his own account, practising at 8 Buckingham Street, Adelphi, W.C. At the outbreak of war he enlisted in the Artists' Rifles, and in October, 1914, received his commission as Second Lieutenant in a London Field Company. He went to the Front in January, 1915, was wounded in May, 1915, and was mentioned in despatches in August. In October he was awarded the Military Cross for work done at Hill 60.

Wounded.

BAILY, BASIL EDGAR [*F.*], Major, 7th (Robin Hood) Bn. Sherwood Foresters. Severely wounded in Flanders. Making good recovery.

Major Baily writes that an operation he underwent a few days ago has proved a great relief. He hopes soon to be out of hospital, after which he goes to Roehampton to have an artificial hand fitted.

TOPHAM, GEOFFREY RONALD GILBERTSON [*A.*], 2nd Lieut., 18th Bn. London Regiment, seriously wounded by a shell at Vimy Ridge on 10th May. Progressing favourably.

Lieut. Topham joined the Artists' Rifles in August 1914; thence he obtained a commission and was transferred to the London Irish Rifles (18th Bn. London Regt.). He went to the Front on 8th July 1915 and has served with his battalion there ever since. His gazetted rank is still "2nd Lieut.," but he has been "acting" Captain since the battle of Loos in September last. He was for a few days in the Base Hospital at Le Tréport and is now in hospital in London.

Honours for Members on Service.

A Supplement to the *London Gazette* issued on the 2nd June has the following announcements:

The King has been graciously pleased to give directions for the following appointment to the Most Distinguished Order of St Michael and St. George for services rendered in connection with military operations in the field:

HUBBACK, A. B. [*F.*], Lieut.-Colonel, 20th Bn. London Regiment (T.F.).

Lieut.-Col. Hubback, whose promotion to Brigadier-General has been announced, was elected Associate of the Institute in 1905 and Fellow in 1909. Before the War he was in the Public Works Department, Kuala Lumpur, Selangor, Federated Malay States.

The King has been pleased to approve of the undermentioned reward for distinguished service in the field:

Distinguished Service Order.

BREWILL, A. W. [*F.*], Major and Hon. Lt.-Col. (temp. Lt.-Col.) Notts and Derby Regiment.

Military Cross.

CALVERT, C. H. [*A.*], temp. 2nd Lieut., Royal Artillery.

MOORE, H. E. [*A.*], Captain, R. Mon. Eng., S.R.

Croix de Guerre.

Mr. Banister F. Fletcher [*F.*] writes that his brother, Major H. Phillips Fletcher [*F.*], of the Middlesex Hussars, has returned to England on being seconded to the Royal Flying Corps. Attached to the French Navy as Commandant of the British Military Observers who were flying with French pilots in the East, Major Phillips Fletcher was awarded the Croix de Guerre in August last for reconnaissances under fire for the first time, and, before leaving the French Squadron, was decorated on two further occasions, once more for work with the Navy and once with the French Army. This entitles him to wear palm leaves and two stars on the riband of the Order. He is the only British officer thus decorated.

On Service with the Forces.

The following is the Thirtieth List of Members, Licentiates, and Students R.I.B.A. serving with the Forces, the total to date being 62 Fellows, 454 Associates, 254 Licentiates, and 277 Students:—

FELLOW.

Ough, Arthur H.: Lieut., Royal Defence Corps, No. 7 Observer Company.

ASSOCIATES.

Belfrage, J. H.: 36th Bn. Royal Fusiliers.
Braithwaite, J. E.: 3/5th West Yorkshire Regt.
Hepburn, J. W.: London Scottish.
Kenyon, A. W.: 2nd Lieut. Kent (Fortress) R.E.
Musman, E. B.: A.S.C. (M.T.).
Nichols, Chas.: 2nd London Sanitary Co., R.A.M.C
Pope, T. Campbell: 2nd Lieut. West Lancs. Divl. R.E.
Pursglove, Archd.: Royal Engineers.
Solomon, Henry: Royal Engineers (South Midland).
Tebbs, C. E.: Engineering Section, Artists' Rifles.
Tench, Edwin J.: Captain on Departmental Duties.
Wood, Douglas: R.N.V.R., A.A.C.

LICENTIATES.

Bryson, R. E.: 7th Middlesex Regt.
Edwards, J. P.: 26th Bn. Royal Fusiliers (Bankers).
Evans, J. M.: Welsh Field Co., R.E.
Jupp, C. K.: Sub.-Lieut. R.N.V.R.
Masters, W. A. H.: 2nd Lieut. for duty under Ministry of Munitions.
Overall, Percy G.: 11th Canadian Field Ambulance, C.E.F.
Prangnell, J. C.: Hants (T.) R.G.A.
Royds, A. F.: Capt., 1/28th County of London Regt. (Joined early in the War, and has been at the Front in France since June last year).
Scott, A. Colman: 28th Bn. King's Royal Rifles.
Walker, Fred.: Army Ordnance Corps.
Walker, J. C.: Major, Lancashire Fusiliers.
Wilson, H.: Major, 64th (H.) Divl. Train.

STUDENTS.

Keep, N. P.: Queen's Westminster Rifles.
Riddle, W. P.: Royal Engineers.
Vonberg, W. C.: London Rifle Brigade.
West, J. A.: London Electrical Engineers, R.E. (T.).

Promotions.

Aitken, A. Danskine [*A.*], to 2nd Lieut., 1st Lowland Field Co., R.E.
Clarke, J. M. [*A.*], to 2nd Lieut., 1st East Lancs. Regt.
Clemesha, F. Chapman [*Licentiate*], to Lieut., 46th Infantry Bn., Canadian Expeditionary Force.

The Rebuilding of Central Dublin.

The Times of 7th June published the following letter from the President:—

SIR,—It is to be hoped, notwithstanding the difficulties and distractions of the times, that the rebuilding of the Sackville Street district will be carefully considered. There is always a temptation to go along the line of least resistance and to rebuild a destroyed area in the quickest possible way in order to rehouse the inhabitants; but if careful thought and a little time are given to the problem now the result should be an ordered and considered scheme worthy of the City of Dublin and its fine architectural traditions.—Yours faithfully,

ERNEST NEWTON, President R.I.B.A.

The Council of the Royal Institute of the Architects of Ireland have adopted the following resolution:—

"His Majesty's Government having indicated its intention of taking steps to facilitate the restoration of the destroyed buildings in Dublin by proposing to assume, as the maximum of its grant, the same liability as would have fallen on the insurance companies had their policies covered loss arising out of the rebellion, the Council of the Royal Institute of the Architects of Ireland would urge on the Government the desirability, in making these *ex gratia* grants, of imposing conditions or restrictions with regard to the design and reconstruction of individual buildings in important thoroughfares such as Sackville Street, Eden Quay, Abbey Street, Earl Street, and Henry Street, so that they shall conform to some general scheme of street im

provement. The Council would emphasise the necessity of imposing such restrictions inasmuch as the Municipal Council has no control over the design of new buildings other than as regards their street alignment, sanitary fitness, and the fulfilment of certain conditions in regard to construction. The Council would urge on the Government the advisability of attaching such conditions to these grants so as to ensure that public money should be expended in the interests of property owners and the enhancement of the architectural dignity of the city. To achieve this object the Council of the Institute would respectfully suggest that a Commission be appointed to control the conditions subject to which designs for new buildings would be sanctioned. Control should be exercised in such matters, among others, as general street improvement, harmony and symmetry in the design of new buildings, and the settlement of questions in regard to right of light, party walls, etc."

Architectural Work in Dublin.

The Committee of the Architectural Association of Ireland have passed the following Resolution :—" In view of the large amount of impending architectural work in Dublin, the Committee of the Architectural Association of Ireland desire to call the attention of architects in practice and assistants to the Register which is kept at the Association Offices. This Register—under the present abnormal conditions—they have decided to throw open free of charge. Every effort will be made to assist practising architects and assistants at the present juncture." Applications should be addressed to :—The Hon. Secretaries, Architectural Association of Ireland, 15 South Frederick Lane, Dublin.

The New Indian Capital.

The *Times* reports that the construction of New Delhi is making satisfactory progress, having regard to the curtailment of the Budget allotment, in consequence of the war, to £333,000 last year and to the same figure for 1916-17.

Much of last year's grant was expended on the many preliminaries required for transforming the rough site into a fine city by levelling, making roads, digging foundations, collecting material, and manufacturing bricks.

The Indian clerks' quarters and the menials' quarters have been completed, and bungalows have been provided for the occupation of the works staff. Experimental bungalows for the higher officials, to be built in the neighbourhood of Government House, are being put in hand, and are expected to be ready for occupation early in 1918.

Meanwhile the central point of interest in the plan has been given careful detailed consideration by the Government and the architects. The foundations of Government House and the large blocks of Secretariats by which it will be flanked have been laid and the basement walls are going up. An indication of the progress at the Governmental centre on Raisina Hill is to be seen in the Royal Academy, where the statues of their Majesties, in Coronation robes, which are to be placed in front of Government House, are exhibited. That of the King, by Mr. Mackennal, is the gift of the Maharaja Sindhia of Gwalior, and that of the Queen, by Sir George Frampton, is the gift of the Maharaja of Bikanir. The keen interest of the ruling princes in the transfer of the capital, which is very welcome to them, is further shown in the gift by the Maharaja of Jaipur of the commemorative column in the central avenue. The column, surmounted by the Star of India, will be well seen from the " Great Place " leading to the central avenue.

Suggestions have been made for completing this avenue, sited upon Indrapat, by a stately colonnade, entered by three large gateways, to commemorate the Indian heroes of the war.

Mr. Wm. Woodward.

Members will be pleased to hear that Mr. Wm. Woodward [*F.*], who has been seriously indisposed for some time, is now convalescent, and was present, looking remarkably well, at the General Meeting last Monday. The President, from the Chair, gave expression to the pleasure felt by members at Mr. Woodward's presence among them again, and Mr. Woodward briefly responded.

A New Architectural Monthly.

The *British Architect*, after forty-three years as a weekly publication, is now making its appearance as a monthly. An editorial foreword explains that the change has often been contemplated as affording better opportunities for the collection and publication of matter of permanent architectural interest than are possible in a weekly. Under Mr. Raffles Davison's able conduct, the *British Architect* has won for itself a unique position among the architectural journals. It is refreshingly independent in its views, always frankly expressing its own mind on the vexed questions of the moment, and with a watchful regard to the dignity of the art and the well-being of the profession which it is its mission to advance. The first number of the new monthly promises well. The reading matter is doubled in quantity, and there are several pages of illustrations, stitched in and paged as part of the text instead of being loosely inset as before. The illustrations include, besides examples of current architecture, a series of Mr. Davison's clever " Rambling Sketches " of modern memorials, reproductions of engravings of old designs for memorials, specimens of some of the late Mr. Mallows' beautiful pencil drawings now on view at the Institute, and a plan illustrating Mr. D. Barclay Niven's suggestions for a Road Bridge over the Thames at Charing Cross. The price of the new venture is threepence.

THE EXAMINATIONS.

Probationership R.I.B.A.

The following letter has been addressed from the Institute to the Masters of Public Schools throughout the United Kingdom who are members of the Head-Masters' Conference :—

DEAR SIR,—I am instructed to inform you that the Council of the Royal Institute of British Architects have decided to discontinue holding the Preliminary Examination which it has been hitherto necessary for a student to pass before being registered as a Probationer.

The Council do not in any way recede from the position which they have invariably taken that for anyone intending to devote himself to the practice of architecture a thoroughly good general education is essential, and that there should be included in that education the study of at least one modern language and of elementary mechanics and physics; but since the Preliminary Examination was started there has been a large increase in the number of public examinations which afford a test of general education, and this, combined with the system of leaving certificates, which will probably be largely extended in the future, has practically done away with the necessity for this Preliminary Examination.

In future all candidates desirous of qualifying as Pro-

bationers R.I.B.A. must produce evidence of their general education satisfactory to the Council. Such evidence would be a certificate of passing some recognised public examination, a school leaving certificate, or in cases where special circumstances have prevented a candidate from acquiring such certificate, a letter from the Head Master of his school certifying that he has undergone a course of study qualifying him to be registered as a Probationer.

The Examination in Geometrical or Perspective Drawing, and in Freehand Drawing, will still be continued for those candidates who are unable to produce satisfactory evidence in the shape of drawings of an elementary knowledge of these subjects.—Yours faithfully,

JOHN SLATER,
Chairman of the Board of Architectural Education.

MINUTES.

At a General Meeting (Business) held Monday 5th June 1916, at 4.30 p.m.—Present: Mr. Ernest Newton, A.R.A., *President*, in the Chair; 22 Fellows (including 14 members of the Council) and 4 Associates (including 2 members of the Council),—the Minutes of the Meeting held 15th May 1916 having been published in the JOURNAL were taken as read and signed as correct.

The Hon. Secretary having announced the death in action of Captain Gilbert Marshall Mackenzie, of the Seaforth Highlanders, it was resolved that the deepest regrets of the Institute for the loss of its gallant Associate be entered on the Minutes, and a vote of sympathy and condolence was passed to his bereaved father, Dr. Marshall Mackenzie [*F.*], and brother, Mr. Alexander G. Mackenzie [*F.*].

A vote of sympathy and condolence was also passed to the relatives of Captain William Harold Hillyer, R.E., *Student R.I.B.A.*, who was killed in action in France on the 22nd May.

Further, the decease was announced of William Leiper, formerly President of the Glasgow Institute of Architects and Member of the R.I.B.A. Council, who was elected Fellow in 1881 and placed on the List of Retired Fellows in 1912; and of Alexander Payne, late District Surveyor for South-East Hackney and Bow, elected Associate in 1870, Fellow in 1882, and placed on the List of Retired Fellows in 1913. On the motion of the Hon. Secretary the regrets of the Institute for the loss of its esteemed Retired Fellows were ordered to be entered on the Minutes and a vote of sympathy and condolence was passed to their near relatives.

The following candidates were elected by show of hands under By-law 10, viz.:—

As FELLOWS (6).

FARROW: GEORGE REGINALD [*A.* 1908].
VARNDELL: CHARLES EDWARD [*A.* 1900, *Grissell Medallist*].

Together with the following Licentiates who have passed the Qualifying Examination:—

CRATNEY: EDWARD, Wallsend-on-Tyne.
LOVEGROVE: GILBERT HENRY.
POULTER: BRIANT ALFRED.
THOMSON: JAMES, Dundee.

As ASSOCIATES (11).

[All candidates passed the Qualifying Examination last year.]

CHEEK: CYRIL CLIFF [*S.* 1912].
COLBECK: HENRY [*S.* 1909].
FYFE: JAMES SIMPSON [*S.* 1913], Sheffield.
GALE: CHARLES HENRY [*Special*], M.Inst.C.E., Hong Kong.
GEE: ERNEST [*S.* 1913], Chester.
HILL: CLAUDE EDGAR [*S.* 1911], Sheffield.
HULL: JAMES VINCENT [*S.* 1913], Garstang, Lancs.
PICTON: CLARENCE SPENCER [*S.* 1913].
RAINGER: HERBERT THOMPSON [*Special*], Cheltenham.
ROUGH: JAMES WILFRED [*Special*], Invercargill, N.Z.
VINDEN: GILBERT [*S.* 1912], Reading.

The proceedings closed at 4.45 p.m.

OBITUARY.

Alexander Payne, who died on the 10th May at the age of seventy-one, was elected Associate of the Institute in 1870, Fellow in 1882, and was placed on the List of Retired Fellows in 1913. Until three years ago he was District Surveyor for South-East Hackney and North Bow, an appointment he had held since January 1880. Mr. Payne was articled in 1860 to Messrs. Pritchett & Sons, of York, Huddersfield, and Darlington. He commenced independent practice in London in 1867. Among his works are the Parsonage House, Ettingshall, Wolverhampton; British Workmen's Institute at Lewes; New Wing to the Cherry Orchard, Charlton; Showrooms, 73 and 75 Brompton Road; 4 Savile Row, W.; Convalescent Home, Quinton, Worcestershire; Factory and Collecting Stations, Oldham; Workmen's Club, 147a Fulham Road; 13a High Road, Knightsbridge; alterations and new reredos, New Church College, Islington; Warehouse, 54 Victoria Park Road, E.; Buildings for Waterworks at Tamworth, &c.

NOTICES.

A GENERAL MEETING (ORDINARY) will be held MONDAY, 19th JUNE 1916, at 4 p.m., for the following purposes:—

To read the Minutes of the General Meeting (Business), held Monday, 5th June 1915; formally to admit Members and Licentiates attending for the first time since their election.

To present the Royal Gold Medal for the promotion of Architecture, conferred by His Majesty the King, to Sir ROBERT ROWAND ANDERSON, LL.D., F.R.S.E. [*F.*] in recognition of the merit of his executed work, his services to architectural education, and his high character and lofty ideals in the art of architecture.

Licentiates and the Fellowship.

The next Examination of Licentiates desiring to qualify for candidature as Fellows will take place in January 1917. Applications for admission to the Examination must be sent in by the end of the current year. Full particulars may be had on application to the Secretary, R.I.B.A.

The Port of London.

At a meeting of the London Society to be held at the Royal Society of Arts, 18 John Street, Adelphi, on the 19th June, at 5 p.m., Mr. Arthur Crow [*F.*] will read a Paper, illustrated by lantern slides, on "The Port of London—Past, Present and Future."

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SIR ROBERT ROWAND ANDERSON, LL.D., F.R.S.E.,
Fellow of the Royal Institute of British Architects.
ROYAL GOLD MEDALLIST 1916.